

DOCUMENTED BRIEFING

DISTRIBUTION STATEMENT A

Approved for Public Release
Distribution Unlimited

RAND

Assessing the Use of "Other Transactions" Authority for Prototype Projects

*Giles Smith, Jeffrey Drezner,
Irving Lachow*

National Defense Research Institute

20020710 049

DOCUMENTED BRIEFING

RAND

Assessing the Use of "Other Transactions" Authority for Prototype Projects

*Giles Smith, Jeffrey Drezner,
Irving Lachow*

*Prepared for the
Office of the Secretary of Defense*

National Defense Research Institute

DB-375-OSD

The research described in this report was sponsored by the Office of the Secretary of Defense (OSD). The research was conducted in RAND's National Defense Research Institute, a federally funded research and development center supported by the OSD, the Joint Staff, the unified commands, and the defense agencies under Contract DASW01-01-C-0004.

ISBN: 0-8330-3127-9

RAND is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND® is a registered trademark. RAND's publications do not necessarily reflect the opinions or policies of its research sponsors.

© Copyright 2002 RAND

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2002 by RAND

1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

1200 South Hayes Street, Arlington, VA 22202-5050

201 North Craig Street, Suite 102, Pittsburgh, PA 15213-1516

RAND URL: <http://www.rand.org/>

To order RAND documents or to obtain additional information,
contact Distribution Services: Telephone: (310) 451-7002;

Fax: (310) 451-6915; Email: order@rand.org

PREFACE

In 1994, Congress authorized use of Other Transactions (OT) for the development of prototypes “directly relevant to weapons or weapon systems.”¹ Under this authority, projects are not required to comply with procurement-specific laws and regulations. A principal objective of the legislation was to enable and encourage a broader range of commercial firms to participate in developing defense systems, thus bringing to such programs similar advanced technologies being developed for the commercial markets.

During the 1994–1998 time period, 72 such projects began. RAND was asked by the Department of Defense (DoD) to assess the experience of those projects, with an emphasis on implementation and goal achievement. This documented briefing presents the results of that assessment. Our results should be of interest to DoD acquisition policymakers and analysts in government and industry.

This research was conducted for the Director of Defense Procurement in the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]), within the Acquisition and Technology Policy Center of RAND’s National Defense Research Institute (NDRI). NDRI is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies.

¹“National Defense Authorization Act for Fiscal Year 1994,” Pub. L. 103-160, Sect. 845.

CONTENTS

Preface	iii
Summary	vii
Acknowledgments	xi
Acronyms	xiii
Introduction	1
Research Results	5
Appendix	35
Bibliography	39

SUMMARY

In 1994, Congress authorized use of OT for the development of prototypes “directly relevant to weapons or weapon systems.” Under this authority, projects are not required to comply with procurement-specific laws and regulations. In effect, OT authority provides a blanket waiver of laws such as the Truth in Negotiations Act and the Competition in Contracting Act, and regulations such as the Federal Acquisition Regulation (FAR), and the defense supplement to the FAR. A principal objective of the legislation was to enable and encourage a broader range of commercial firms to participate in developing defense systems, thus bringing to such programs similar advanced technologies being developed for the commercial markets.

During the 1994–1998 time period, 72 such projects began. RAND was asked by DoD to assess the experience provided by those projects. The objective of this assessment was to determine the overall effectiveness of this new acquisition approach. Specifically: *Do the benefits expected from relaxing the process controls justify the possible costs that might be incurred?*

We conducted this assessment by performing a detailed examination of 21 projects, comprising about one-third of the total population that had accumulated some track record by late 1999. We addressed four topics:

- What were the general characteristics of typical OT agreements?
- What benefits appear to have been achieved through use of the OT process?

- Were there any apparent disadvantages encountered, and specifically were government interests appropriately protected?
- What were the net effects after balancing the apparent advantages and disadvantages?

Our assessment of OT prototype projects, completed in March 2000, yielded three general conclusions:

Important new industrial resources are now participating in DoD prototype projects because of the freedoms inherent in the OT process. However, evidence of that cannot be found by counting "new" company names on a list of projects; we found few firms with no prior DoD contracting experience now working on DoD projects, with most of those at the subcontractor level. The important new industrial capability is drawn from segments of major firms that had been focusing exclusively on commercial projects but are now willing to apply their skills and products to military prototypes.

The benefits of OT are broader than just the addition of new industrial resources. The flexibility of the OT process has been used to: (a) achieve better use of industry resources through innovative business arrangements and project designs; (b) improve management of risks and uncertainties through freedom to modify the program as it evolves; and (c) achieve better value through cost sharing and reduction of transaction costs. Overall, more effort is being devoted to product and less to process.

Some risks to the government are incurred, but we believe the immediate rewards substantially outweigh the risks. Risks arise mainly through relaxing DoD demands for access to the firm's financial records, and ownership of intellectual property (patents and data). However, such relaxation of DoD rights applies to only a few of the OT prototype projects, mainly those involving products with strong commercial market potential and where the firm contributes a significant portion of the development resources. Even in those few projects, we believe the risks to DoD are limited. Verification of cost records becomes relatively unimportant when a firm is contributing a large share of project costs. Less-than-complete government ownership of intellectual property might lead to increased costs in future phases of the project, but those risks are limited. This is in part because the possible future costs should be discounted to

some degree as they are in the future, and in part because they typically apply in areas where the technology is moving fast and where the value of specific kinds of knowledge can rapidly decay. *Furthermore, if the flexibility in negotiating intellectual property and financial audit clauses is removed from the OT authority, most if not all of the new industrial resources would again become unavailable to DoD.*

These conclusions are mostly subjective and interpretive. They do, however, represent the views of a broad cross section of DoD and industry project managers and agreement officers who have been managing OT prototype projects. The rewards of creating and managing a more efficient and effective program structure and management process have led those participants to be uniformly enthusiastic about the OT process and also advocates for its further use.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of personnel in the Office of Defense Procurement, USD(AT&L), and the Defense Advanced Research Projects Agency in making available the data required to execute the research. We also greatly appreciate the assistance and participation of program managers and agreement officers in both government and industry who provided documentation on request and spent time with us discussing their experience of implementing OT.

Any remaining errors are the responsibility of the authors.

ACRONYMS

Symbol	Definition
COSSI	Commercial Operations and Support Savings Initiative
DARPA	Defense Advanced Research Projects Agency
DD21	New Navy ship program
Dem/Val	Demonstration/Validation
DFARS	Defense Federal Acquisition Regulation Supplement
DoD	Department of Defense
DUAP	Dual-Use Applications Program
EELV	Evolved Expendable Launch Vehicle
FAR	Federal Acquisition Regulation
GEO	Geostationary orbit
IR&D	Independent research and development
MIDS	Multifunctional Information Distribution System
MMC	Metal Matrix Composite
NCAT	National Center for Applied Technology
NDRI	National Defense Research Institute

NIMA	National Imagery and Mapping Agency
NML	National Media Laboratory
OT	Other Transactions
OTA	Other Transactions Authority
UAV	Unmanned Air Vehicle
UCAV	Unmanned Combat Air Vehicle
U.S.C.	United States Code
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics
VTOL	Vertical Takeoff and Landing

INTRODUCTION

OT Is a Departure from Standard Procurement Practice

- **Law allows procurement of prototypes “directly relevant to weapons or weapon systems” without complying with procurement-specific laws**
 - *72 projects started from 1994 through 1998*
- **Expected to improve government access to affordable commercial technologies**

NDRI

RAND

Two consistent themes in the Department of Defense's (DoD's) acquisition reform efforts over the last several decades have been: streamlining the process by reducing the burden caused by regulations and oversight procedures and adopting commercial practices and products. One reason to adopt commercial practices was to

broaden the direct participation of commercial industry on DoD projects. The thought was that if DoD's business processes matched commercial practices, an important set of factors that create disincentives for commercial industry participation on DoD projects would be removed. In 1994, Congress authorized the use of Other Transactions Authority (OTA) for the development of prototypes directly relevant to weapon system programs.¹ The authority to use Other Transactions (OT) was initially given only to the Defense Advanced Research Projects Agency (DARPA); several years later, it was extended to the military services and other defense agencies. OTA is a powerful reform intended to further DoD's objectives of improving the efficiency of the acquisition process and encouraging the direct participation of commercial industry.

DoD's access to commercial industry has become increasingly important. DoD no longer dominates the market in several key technology areas, particularly information technology and systems. The result is that many technological advances are occurring in the commercial market. Under traditional approaches to acquisition, DoD does not have access to these innovations; commercial firms consider DoD's business processes to be too burdensome to warrant direct participation and its traditional acquisition rules require pass through of such regulatory constraints to subcontractors. Of particular concern to commercial industry were cost accounting standards and processes, requirements for competition, lack of use of performance-based specifications, and intellectual property rights.

At the same time, a contracting defense industry hurting from the decline in DoD development and procurement funds was lobbying strongly for the relaxation of regulations perceived as burdensome and costly. Defense industry was advocating a more common sense approach to DoD acquisition that would enable companies to be more efficient and effective in their use of resources.

OT provides a blanket waiver of the laws and regulations that underpin the concerns of both the commercial and the defense industry. Processes normally required by the Truth in Negotiations Act, the Competition in Contracting Act, the Federal Acquisition

¹The legislative history, intent, and concepts underlying the origins and use of Section 845 OTA are described in detail in Kaminski (1996) and Dunn (1995; 1996a,b).

Regulation (FAR), and the Defense Federal Acquisition Regulation Supplement do not need to be adhered to. Instead, OT allows government and industry to define their relationship through negotiations without the normal constraints. Under OT authority, the program management approach, program objectives and criteria for measuring progress, oversight and reporting requirements, price to the government, fee for industry, and the statement of work are embodied in an Agreement reflecting the results of this negotiation. Agreements are inherently more flexible than traditional contracting vehicles, and could be changed simply by the mutual agreement of government and industry participants. The quality of an Agreement is more closely associated with the skills and experience of the government and industry managers and contracting officers than a traditional FAR-based contract. OT usually gives the contractor greater program management responsibility and authority, but also gives the government greater insight into contractor decisions and status. Rather than the adversarial relationship between government and industry under traditional processes, OT requires a more collaborative working relationship.

Because program management under OT can potentially remove the traditional oversight and accountability processes, critics have been concerned that DoD's interests might not be adequately protected. In particular, the lack of traditional cost accounting and auditing procedures could expose DoD to greater financial risk. Lack of ownership of the intellectual property resulting from OT development activities could constrain future innovation or impose future costs on the government because of limits on licensing the technology. Similarly, the lack of technical data obtained under OT could adversely affect DoD's ability to support systems using that technology. These are serious concerns that should be addressed before OT is more widely applied.

In January 2001, nine months after the completion of this research, DoD published new guidelines for the use of OT that addressed many of the concerns expressed by critics. The guidelines contain language regarding when OT use is appropriate, the definition of nontraditional firms, and auditing procedures that could have adverse affects. That language is taken directly from the statute (10 U.S.C. 2371, Section 845), which was revised in the FY01 National Defense Authorization Act. There are indications that some of this

language, particularly regarding the conditions under which OT can be used, may be having adverse (and unintended) consequences by reducing the opportunities for DoD to gain access to commercial technologies and developments. In light of this, we believe that DoD should conduct further evaluations on the impact of the guidelines on OT use and benefits.

The research reported here describes the OT implementation experience to date and assesses its costs and benefits. In the course of this research, we also begin to address the critics' concerns regarding financial risk and intellectual property.

The next section presents the main briefing documenting the results of the research. A subsequent section contains a set of backup charts that provide more detail on the sample of projects we examined.

RESEARCH RESULTS

RAND Was Asked to Assess DoD Experience with OT for Prototypes

- **Overarching question: Have results justified the exceptional freedom from *mandated* compliance with extensive rules on:**
 - *Management oversight?*
 - *Fiscal accountability?*
 - *Ownership of intellectual property?*
 - *Negotiation of contract terms?*
 - *Etc.?*

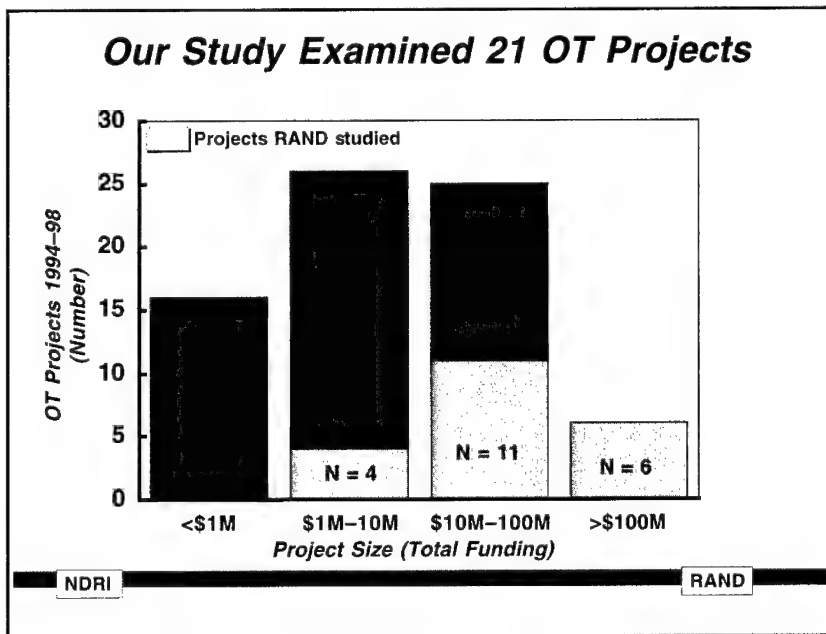
NDRI

RAND

The 1994 congressional authorization to use OT for prototype projects is potentially one of the most powerful reforms to the acquisition process in a long time. In one action it swept away several decades' accumulation of laws and procedures that constrained managers in how they designed and managed such projects as well as how the government-industry relationship was defined. While the

intent is never spelled out explicitly in congressional documents, it is apparent that one major goal was to improve DoD access to technologies that were being developed for the commercial market. We now have several years of experience with the use of OT authority for prototype projects, enough to make an initial assessment of how the process is working.

In fall 1999, RAND was asked to perform an assessment of OT experience for prototype programs. While there are many detailed questions and issues involved in assessing OT experience, we believe most can be subsumed under one overarching question: Have the results justified the authority to perform projects without being required to comply with the historical accumulation of laws and procedures? Our primary research objective was to address that issue.



Our strategy was to examine a sample of 21 projects in some detail, nearly one-third of the 72 prototype programs started during the 1994-1998 time period. Our sample includes all of the very large OT prototype projects and a good distribution of the medium and smaller projects.¹ We did not examine any of the very small ones. Whether this exclusion introduced any bias in our conclusions is unknown.

Our sample includes a wide range of system types as well as several programs each from DARPA, the National Imagery and Mapping Agency, and the three military services. In each project we examined the agreements and associated documents carefully, and we interviewed project managers in both DoD and industry. The information we gathered through these discussions was amazingly consistent across the various programs. That consistency encourages us to

¹Project size was measured in then-year dollars.

8 Assessing the Use of “Other Transactions” Authority for Prototype Projects

believe that our results are representative of the overall OT experience with prototype programs, but it is not absolutely conclusive.

Study Results Were Constrained by Difficulties in Measuring OT Effects

- Too many variables, too few programs for quantitative analysis
- Traditional metrics—cost growth, schedule slip, performance shortfall—are inappropriate for prototype projects
- Cannot measure path not taken
- Most projects not yet completed
- Research results are qualitative and not rigorously provable

NDRI

RAND

One important element of our research was to develop a set of metrics that would measure the relative effects of OT on program outcomes and OT's broader policy goals. While attempting to accomplish this, we were unable to develop any practical quantifiable metrics that others would find credible. The few quantifiable metrics we uncovered are either misleading (e.g., the number of nontraditional contractors) or unverifiable (e.g., cost avoidance). This result affects both the kind of information we can present and the kind of conclusions that can be drawn.

The reasons we did not find a practical approach to such metrics are classic in the field of acquisition policy analysis. We cannot perform a statistical comparison of a group of OT programs versus a group of conventional programs because there are too many variables and too few programs. Furthermore, the traditional metrics for such a comparison, and where we have a good historical database, are elements such as cost growth and schedule slip; those are inappropriate for prototype programs that are inherently risky.

It is not practical to compare a single OT program with a counterpart conducted under traditional contracting methods because we never have an analog program that is remotely comparable. We do not have data on what the program would have been like under traditional methods. And finally, most of the programs in our rather small sample are still under way so we do not have true outcomes.

Thus, we rely largely on qualitative information in this analysis—the judgments and opinions of experienced managers who have run both kinds of programs. We are unable to analytically prove the validity of those judgments and opinions, for all the reasons noted here. For those same reasons, critics are unable to disprove the claimed benefits of OT agreements or to quantitatively demonstrate the superiority of another policy or process.

We Explored Four Topics

- **Characteristics of typical OT agreements**
- **Benefits of OT process**
- **Protecting DoD interests**
- **Conclusions**

NDRI

RAND

We present our results in four sections: a short description of typical OT agreements, followed by a discussion of the major benefits that we see flowing from the OT authority; we then address the major criticisms of the process, followed by our general conclusions.

Throughout this research we were generously granted access to information that the firms considered proprietary or commercially sensitive. To enable unrestricted distribution of this document, we avoid reporting any such information here, including source attribution to certain expressions of opinion or linking some specific result to a specific project.

OT Agreements Differ from Standard Contracts

- **Relatively short documents (10–30 pages)**
- **Each clause reflects a negotiated position tailored to needs of all parties**
 - *FAR/DFARS used as a tool kit, not a rigid format*

NDRI

RAND

OT agreements are different from conventional contracts in several important ways. One is that they are relatively short and clearly written without use of specialized legal language. But probably the most important fundamental difference is that each and every clause in an agreement represents a negotiated position tailored to the needs of all parties. The essence of an OT agreement is that there are no rigid rules that must be applied, which opens an enormous range of opportunities for innovative strategies and processes.

Those writing the agreements are thoroughly versed in the FAR and associated legislation, and they use these procedures as a framework when designing an agreement. In most ways the agreements are consistent with traditional contracts, but they differ in a few important ways. We identified six special features that are typical of OT agreements and that lead to a very different relationship between DoD and industry.

OT Agreements Are Collaborative Partnerships Between DoD and Industry

- Deliverable is typically best effort toward a specified system performance *goal*
- Prototype development is divided into several incremental milestones
- All terms may be modified by mutual agreement, including canceling the project
- Each party's financial obligation is limited to a specified amount
- Prime contractor has complete responsibility and authority for managing the project
- Industry frequently shares costs with DoD

NDRI

RAND

While each agreement is unique and reflects the needs of that particular project, as well as the preferences of the managers and agreement officers, we find that certain key features are reflected in most agreements. Taken together, these features define a new relationship between DoD and industry, one emphasizing a collaborative partnership where all parties share a common set of objectives:

- Reflecting the uncertainty that is typical of most development projects, the objectives are stated in terms of goals rather than fixed requirements, and the industry team is obligated only to deliver its best effort toward achieving those goals. The lure of future business flowing from a successful prototype is a powerful incentive to high performance.
- Almost every project is structured as a sequential series of incremental steps, each culminating in a milestone review. Successful completion of a milestone typically triggers payment of a specified amount to the contractor and authorization to proceed with

the next incremental step. In some cases, each milestone is treated as a fixed-price task, thus eliminating the need to verify actual costs incurred.

- Prototype development projects are not highly predictable, and some modifications to the original plan are usually needed as experience accumulates. Such changes can be made by agreement of all parties, with little or no administrative overhead other than to document the change and make corresponding adjustments in future plans and schedules. Typically, no external review or approval is required as long as the change does not affect the overall project goals or the total project costs. Such a change may even include canceling the project; this occurred in one of the projects we examined.
- Each party's financial obligations are stated at the beginning, and neither party has any obligation to spend more than its specified amount.
- The contractor management team has full authority to manage the project in a manner and style it considers best. The DoD program management staff participates in management decisions and frequently contributes to solving the problems at hand, but the staff has no authority to direct any action by the contractor unless it is treated as a change in scope, with a corresponding change in projected costs.
- Finally, industry frequently makes an explicit financial contribution to the project. This occurs even when the product has a purely military application but the industry team considers it an opportunity to gain important skills that might contribute to future projects. Industry contributions often come from independent research and development (IR&D) accounts.

Taken together, these agreement elements provide a powerful degree of flexibility to manage the development of projects that involve a considerable degree of uncertainty and risk. They also define a very different government-contractor relationship from that typically found in traditional programs.

We Explored Four Topics

- **Characteristics of typical OT agreements**
- **Benefits of OT process**
- **Protecting DoD interests**
- **Conclusions**

NDRI

RAND

Next we will outline the major benefits that appear to have been achieved through use of the OT authority.

***Benefits Are Broader
than Expansion of Industry Base***

- **Originally anticipated benefit is being achieved to a limited extent**
 - *Private industry more willing to work for DoD*
- **Other important benefits are emerging**
 - *Better management of risks and uncertainties*
 - *Better project structure through new and innovative business relationships*
 - *DoD gets more value per dollar spent*

NDRI

RAND

We noted earlier that one of the motivations for the original enabling legislation was to expand the industry base available to DoD. We find that goal is being achieved to at least a limited degree. We also find that several other important benefits are being achieved as managers in both DoD and industry learn to utilize the opportunities inherent in the OT process. Each of these four benefits is addressed on the following figures.

Benefits Are Broader Than Expansion of Industry Base

- **Originally anticipated benefit is being achieved to a limited extent**
 - *Private industry more willing to work for DoD*
- **Other important benefits are emerging**
 - *Better management of risks and uncertainties*
 - *Better project structure through new and innovative business relationships*
 - *DoD gets more value per dollar spent*

NDRI

RAND

At the beginning of this study we spent a lot of time trying to find evidence that new companies had entered the ranks of DoD suppliers. We found a few. But we finally realized that a major part of the new activity comes from segments of large firms where the firm is a traditional supplier: names like 3M, Lucent, Motorola, Eastman Kodak, Oracle, and others. But major segments of those firms, using corporate funds to develop products for the commercial market, had previously been unwilling to work for DoD under the traditional contracting process. Now those broader segments of the firms are willing to work for DoD under an OT agreement. At Motorola—to cite one specific example that was quoted to us—one group containing about 200 engineers works for DoD under a FAR-type contract, but under an OT agreement it has access to the entire corporate development staff. The key difference is that, under an OT agreement, those firms can protect their intellectual property—a topic we discuss later in this briefing.

Our search for new firms with no prior experience working for DoD only led to one prime contractor, Frontier Systems, and that example must be caveated because the senior managers in the firm are thoroughly familiar with traditional DoD and FAR-type contracts, but they refuse to accept the associated regulatory burdens. There are a few new firms appearing as specialized suppliers (e.g., a surfboard manufacturer building the wings of the Unmanned Combat Air Vehicle), but even those are exceptions to the rule.

The use of OT agreements is achieving the goal of making major segments of the industry available to DoD for the first time. Demonstrating that cannot be done by simply counting new names on a list of contracts and instead requires a series of individual company studies. This also illustrates the difficulty we had in developing meaningful quantitative metrics.

OT Allows DoD to Better Manage Risks and Uncertainties

- **Change and adaptability are built into the process**
 - *Plan can be altered by mutual agreement with minimal administrative burden*
- **Deliverable is frequently best effort**
 - *No obligation to deliver to a predetermined specification if that proves impractical*
 - *Incentives used instead of fixed obligation*

NDRI

RAND

Another major benefit of the OT process is the improved ability to manage the risks and uncertainties that are inherent in any development project. OT agreements typically contain a clause stating that any time progress or results indicate that a change would be beneficial to project objectives, such a change can be made through mutual agreement of DoD and industry managers. As long as the change does not affect the stated program goals, or the total cost, those changes do not require external review and can become effective immediately upon agreement, with minimal documentation internal to the project. Such flexibility provides powerful opportunities to better cope with the problems and opportunities that occur when developing new systems and components.

The authority to change also extends to the premature termination of a project if all parties agree. In one of the projects we studied, the project was terminated at the halfway point because progress was unsatisfactory and effective corrective action seemed unlikely. In another case, where three firms were competing during the concept

design phase, the DoD program manager advised one firm that it was far behind the other two and should drop out, which it did well before formal downselect. We found many other examples of management flexibility during our study.

Another powerful feature of most OT agreements is that the objectives are stated in terms of general goals rather than detailed product specifications, thus allowing maximum freedom to adjust the final design to match emerging knowledge of the options. Instead of commitment to meet specific product specifications, a variety of incentives are incorporated in the agreements that are generally built around progress payments contingent on successful completion of a milestone event.

OT Enables Innovative Business Relationships

- DoD can negotiate with competitive firms prior to award
- DoD can more easily support creation of industry partnerships and consortia to better match project needs
- DoD can pay contractors for successfully meeting established milestones rather than reimbursing them for incurred costs
 - *Some milestones can be fixed price*
- DoD can work directly with subcontractors and consortia members

NDRI

RAND

OT agreements provide an opportunity to create innovative business arrangements that suit the particular needs of the individual project. We found numerous examples during our survey.

DoD program managers can negotiate independently with individual firms in a competitive environment to improve the quality of the proposal (e.g., a more focused statement of work) prior to award.

In several instances, the initial solicitation yielded proposals showing that a partnership of two or more firms would likely yield a better product. The DoD managers could negotiate with the firms and solicit a new proposal from such a partnership without the lengthy process of preparing and advertising a new solicitation. Sometimes an industry partnership is more easily formed through informal consortia, with one firm being the contract agent. An OT agreement offers opportunities for such arrangements that would be prohibited under standard contracting rules.

While a few of the OT agreements call for reimbursement of incurred costs, most tie progress payments to satisfactory completion of milestone events. In a few cases those milestones become incremental fixed-price obligations, thus obviating the need for verifying costs incurred. Such an arrangement can be especially attractive when the product is expected to have a strong commercial market.

The OT agreement offers the DoD program manager an opportunity to become directly involved in project activities at both the prime and subcontractor levels. This enables the program manager to have a much better understanding of the true project status than in a typical program where the prime contractor controls the flow of information to the customer.

OT Procedures Can Yield More Value per DoD Dollar Invested

- **Leverage private investment through sharing of costs, risks, and benefits**
- **Reduce transaction and overhead costs**
 - *Vest more authority in government/industry management team*
 - *Involve small, sequential steps, with obligations limited at each step*
 - *Use IR&D rates, other commercial practices*
- **Participants claim significant cost avoidance**

NDRI

RAND

The OT process appears to provide more value per dollar invested by DoD. This was the single most common metric used to describe the benefits of OT, but it is extremely difficult to verify the claims of government and industry program managers. Nevertheless, the logic and mechanisms underlying those claims appear valid. Thus, while we cannot provide a quantitative estimate, we believe that DoD is obtaining more value per dollar. This is usually presented in terms of relatively increased engineering labor hours applied per dollar spent.

One of the obvious mechanisms is through direct sharing of the costs and risks, as well as the benefits, by the contractor. Another way is through reduced transaction and overhead costs. Some such benefits accrue from the direct involvement of DoD managers and the consequent lesser amount of formal oversight and reporting required in such projects; other benefits flow from the incremental, step-by-step process that is typically employed in the prototype development, with a consequent reduction in risk-mitigation measures by

the contractor; and in some cases the ability to use IR&D funds, with their lower overhead burden, or other commercial practices leads to lower program costs.

The full consequences of such cost avoidance measures are impossible to document; as discussed earlier, there is no "reference case" for comparison. We rely on the impressions of experienced managers in both DoD and industry who strongly assert that such effects are real, based on their accumulated experience with other projects conducted under standard procedures. One manager of an especially complex program, with multiple competitive contractors, asserted that he had completed the project at half the cost and half the time that would have been required under normal contracting procedures. The accumulated weight of such expert opinion is persuasive.

We Explored Four Topics

- **Characteristics of typical OT agreements**
- **Benefits of OT process**
- **Protecting DoD interests**
- **Conclusions**

NDRI

RAND

We now turn to the third main topic: protection of DoD interests in an OT project.

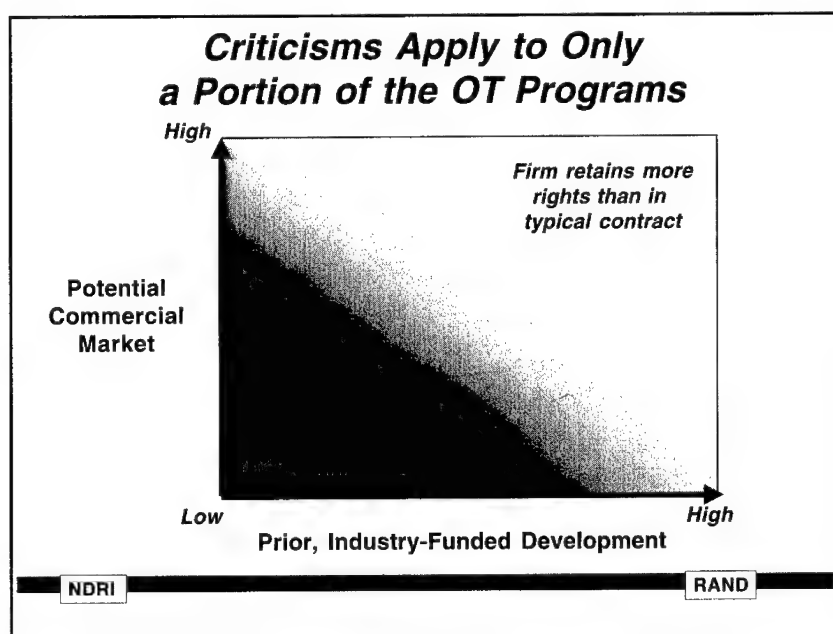
Critics Say DoD Interests Are Not Adequately Protected

- **Agreements limit DoD access to financial records**
 - *Reduce DoD's ability to verify costs*
- **Agreements limit DoD rights to intellectual property**
 - *Reduce future ownership of inventions and data*

NDRI

RAND

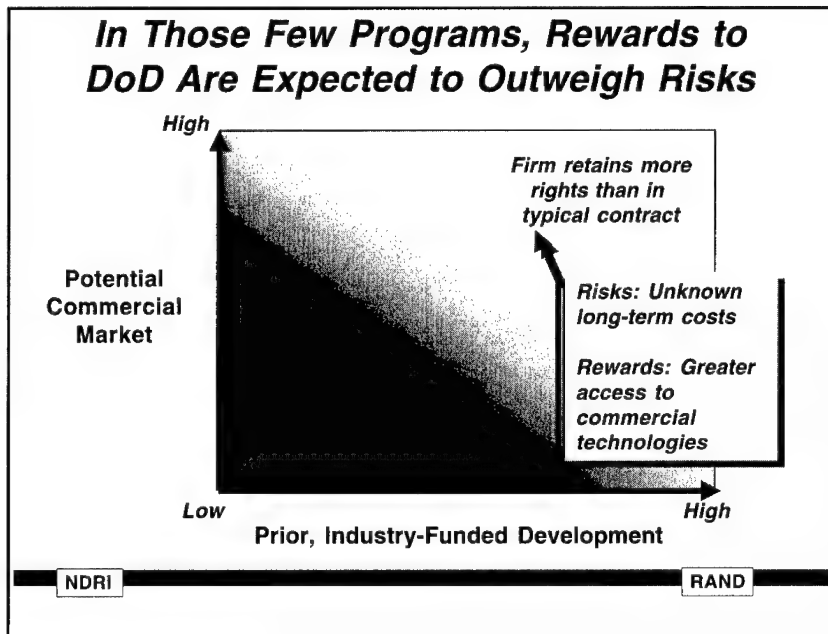
It is not surprising to find some criticism of any process that appears to circumvent procedures based on several decades of experience. We find most such criticisms focus on two points: (1) that some agreements limit, to varying degree, direct DoD access to financial records in order to verify that contractor costs have been properly stated, and (2) that some agreements limit the DoD rights to intellectual property flowing from the project. When examining these criticisms we find it useful to categorize the projects along two dimensions (next figure): the potential commercial market for the product and who owns the intellectual property critical to its development.



When categorized along those lines we find that the criticisms of OT are relevant to only a special subset of OT prototype programs. In the classical military combat system development there is little commercial market for the product, and the firms doing the development bring to the process intellectual property already owned by the government because it was developed in prior military developments. We find that the OT prototype programs that fall in the lower left corner of the graph typically comply closely with FAR-type provisions dealing with financial records and intellectual property. There is no basis for criticizing these projects because of relaxed oversight controls.

The interesting cases are those that fall in the upper right corner of the graph. Here the firms expect the main market for the product to be in the commercial sector, and they bring to the project skills and resources that mostly have been developed with corporate funds, and frequently involve trade secrets of considerable value. It is not surprising that the firms would insist on retaining control over that

information. But corporate resources of this type are typically the things the OT process was designed to make available to DoD: cutting-edge technologies in the information processing area where DoD does not have to pay the full development costs. Applying classic regulatory oversight controls to projects of this type would most probably eliminate such projects, thus largely nullifying one of the main advantages of the OT process's design. Furthermore, only a relatively small fraction of the programs we studied exercised the full range of exemptions, thus further reducing the overall exposure of the government to possible damage stemming from relaxed oversight controls.



In this special category of projects we expect that the long-term benefits to DoD will outweigh the risks, but we cannot prove that assertion. The main uncertainty involves the future consequences of DoD having only limited rights to intellectual property (e.g., patents or government licenses for technologies, data rights affecting future operating and support costs) that might be involved in future development projects or deployment issues. Lacking full rights clearly represents some risk of future costs. However, those future costs should be discounted to some degree, and they typically apply in areas where the technology is moving very fast and where the value of specific kinds of knowledge can rapidly decay.

Against those risks there are the immediate advantages of timely and low-cost access to the kinds of technology that is becoming increasingly important to DoD (e.g., information technology). Right now, the immediate rewards appear to substantially outweigh the risks of future costs.

We Explored Four Topics

- **Characteristics of typical OT agreements**
- **Benefits of OT process**
- **Protecting DoD interests**
- **Conclusions**

NDRI

RAND

Our conclusions are briefly summarized on the following two figures.

Experience to Date Is Encouraging

- **OT process is providing broad benefits**
 - *Access to commercial developments in cutting-edge technologies*
 - *Innovative business relationships*
 - *Flexibility to manage risks*
 - *More value per dollar invested*
- **Risks to government appear limited**
 - *Compromise made in only a few programs, in trade for other benefits*
 - *Long-term value of those trades is hard to estimate*

NDRI

RAND

We said at the beginning that the OT process is potentially one of the most powerful reforms to the acquisition process that has occurred in a long time. We find the results, to date, on the 21 projects examined in this study encouraging. The OT process is providing improved access to important commercial technologies as well as improved efficiencies in conducting technologically risky prototype projects. It is clear that as DoD managers and contracting personnel became familiar with OT processes, the quality of the agreements and program implementation improved. While these benefits are impossible to quantify in an analytically rigorous manner, we found a strong consensus among both industry and government managers that these procedures can be beneficial when applied to the appropriate projects (described in the next figure).

It should also be noted that to achieve the full benefits inherent in the OT process requires that government project managers and agreement officers exercise some initiative and skill in their man-

agement duties. The OT process allows them to actively manage instead of following routine procedures.

It is undeniable that the relaxation of financial and other controls inherent in the OT process opens some opportunity for abuse. However, the process also strengthens the access and information available to government managers, thus reducing such risks. Furthermore, in the sample we examined, reduced oversight controls were limited to only a few of the projects and even there they appear modest in comparison with the benefits. But we must add the caveat that those risks cannot be rigorously assessed at this time.

OT Process Appears Appropriate for Certain Kinds of Projects

- **Ones offering DoD and industry an opportunity to jointly develop a product with strong future market potential**
 - *Gives DoD access to commercially driven technology with dual-use applications*
- **Ones with considerable uncertainty in outcomes**
 - *Provides DoD the flexibility of best-effort deliverable and the freedom to change or cancel the project*
- **Ones offering DoD the opportunity to benefit from innovative business relationships**
 - *Allows DoD and industry to assemble strong consortia teams*

NDRI

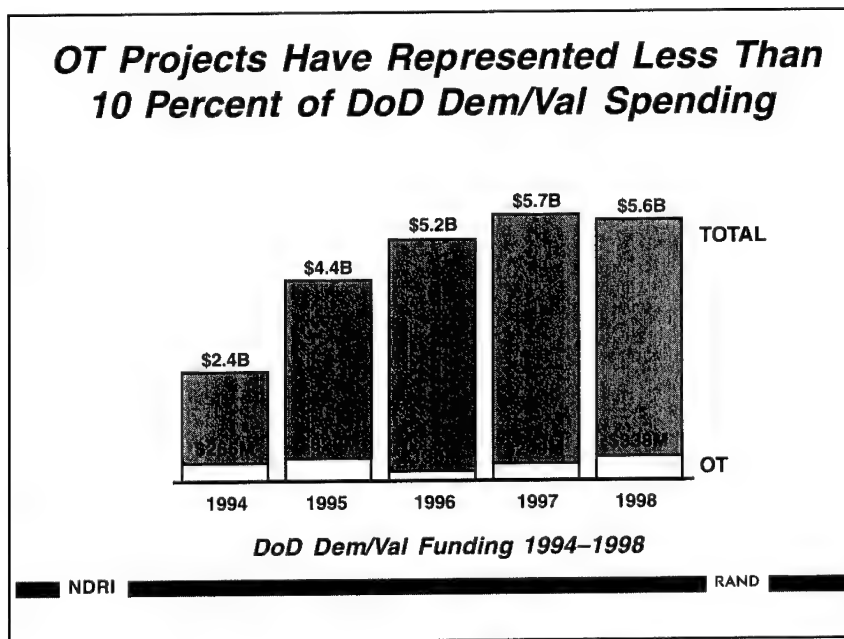
RAND

An underlying research issue was an attempt to determine the conditions under which OT application makes sense. Our research to date suggests that when at least one of the following conditions is met, OT will likely be beneficial:

- When DoD desires access to technology that is predominantly the result of commercial development, OT provides a mechanism for nonintrusive, value-added participation.
- When there is considerable uncertainty regarding both performance goals and what is technically achievable and affordable, OT provides the necessary flexibility to manage high-risk projects.
- When DoD might benefit from innovative business relationships with industry, or among industry participants, OT provides the mechanism to define those relationships.

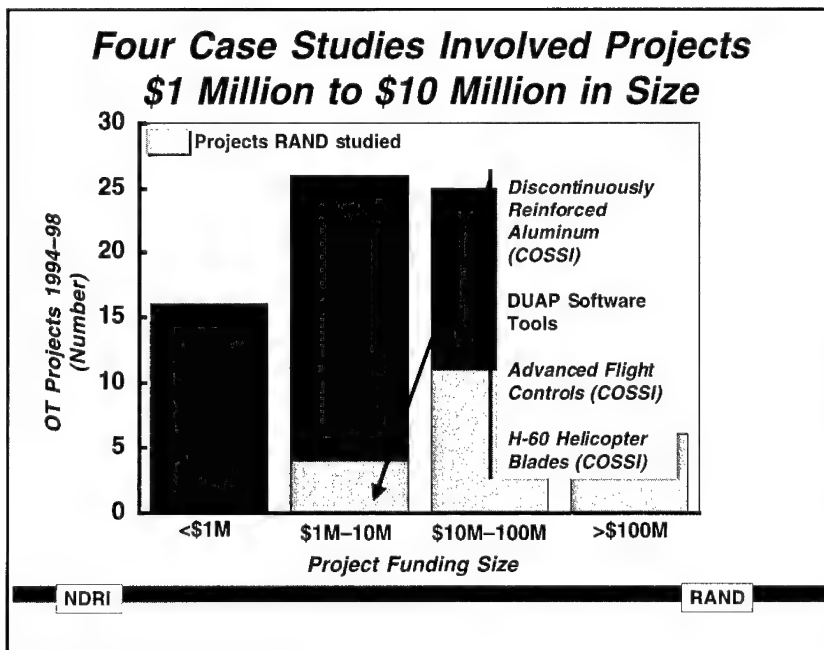
APPENDIX

The following figures provide supporting information relevant to the study but not included in the main briefing.

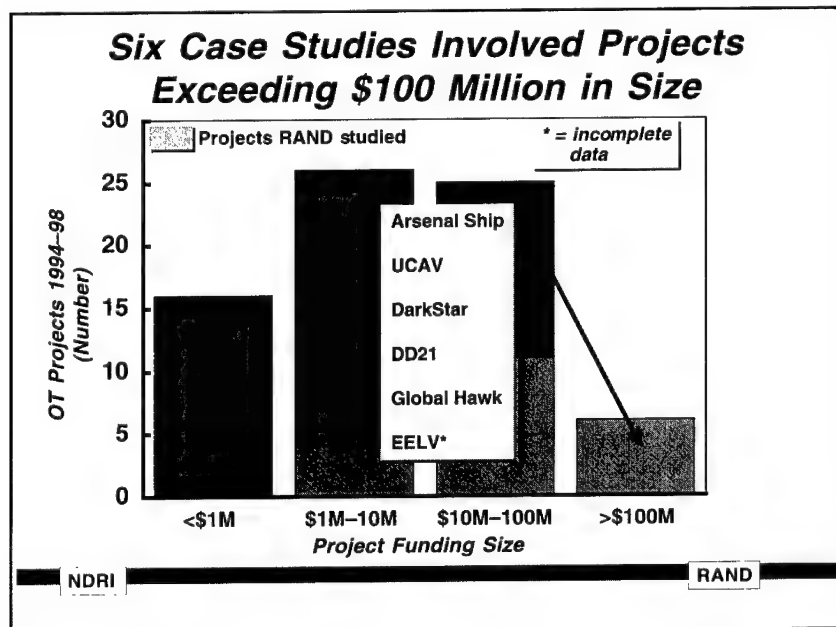
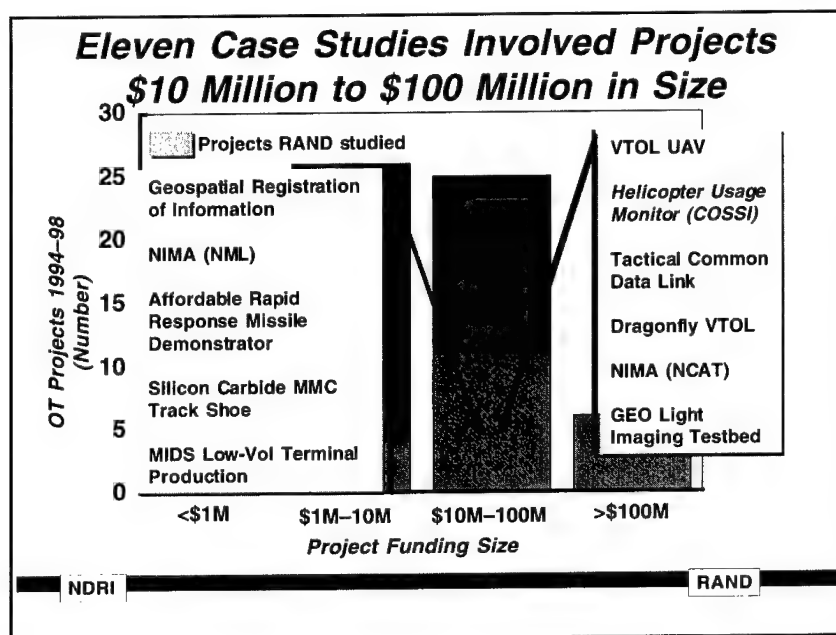


We have seen very limited usage of OT to date. The projects that were started under an OT agreement during the 1994–1998 time period have a cumulative value of slightly more than \$1 billion, which is less than 10 percent of the Demonstration/Validation (Dem/Val) budget (budget category 6.3B) during those years.

The actual portion of the Dem/Val budget used for OT projects is somewhat less than 10 percent because some of those projects were conducted under the Commercial Operations and Support Savings Initiative. Those projects are intended to leverage private sector research and development by inserting leading-edge commercial technologies into fielded military systems to reduce operations and support costs. Cost sharing is mandated (at least 25 percent must come from nonfederal funds) and government funds are frequently drawn from budget categories other than Dem/Val, so the OT prototype projects represent an even smaller fraction of actual Dem/Val projects during that period.



This and the following two figures identify by name the projects included in the sample examined during this study. Note that the Evolved Expendable Launch Vehicle project was examined in less detail than the others because of constraints in data availability.



BIBLIOGRAPHY

Advanced Research Projects Agency, *High Altitude Endurance UAV (TIER II Plus) Phase II Selection Process Document ("Solicitation")*, MDA972-95-R-0001, February 15, 1995.

American Bar Association, 4th Annual Federal Procurement Institute, *Transactions*, Vols. I and II, March 1998.

_____, *Department of Defense 'Other Transactions': An Analysis of Applicable Laws*, Ad Hoc Working Group on Other Transactions, Chicago: ABA 2000.

"ARPA Signs 100 Innovative Agreements over Five Years," *Army RD&A*, January–February 1996.

Arsenal Ship Program Solicitation, Solicitation No. MDA972-96-R-0001, May 1996.

Bingaman, Jeff, letter to Dr. Jacques S. Gansler (Under Secretary of Defense for Acquisition and Technology), U.S. Senate, May 18, 2000.

Bolos, Joseph T., "A Report on the Use of 10 U.S.C. 2371 'Other Transaction' Authority and 10 U.S.C. 2371 Section 845 Prototype Authority in the Department of Defense," DARPA Acquisition Conference, March 1997.

Chen, Kathy, "Pentagon Finds Fewer Firms Want to Do Military R&D," *Wall Street Journal*, October 22, 1999.

Defense Advanced Research Projects Agency, *Other Transactions Authority, Model Agreement*, No. MDA972-9*-3-00**, January 31, 1997.

Defense Contract Management Command, Agreements Administration Centers, "Administration of Other Transactions," no date.

Defense Systems Management College, Contractor Finance Department, "Independent Research and Development (IR&D) and Bid and Proposal (B&P) Costs," teaching note, October 1993.

Department of Defense, *Annual Report on Cooperative Agreements and Other Transactions Entered into During FY95 Under 10 U.S.C. 2371*, 1995.

_____, *Annual Report on Cooperative Agreements and Other Transactions Entered into During FY96 Under 10 U.S.C. 2371*, 1996.

_____, *Annual Report on Cooperative Agreements and Other Transactions Entered into During FY97 Under 10 U.S.C. 2371*, 1997.

_____, *Annual Report on Cooperative Agreements and Other Transactions Entered into During FY98 Under 10 U.S.C. 2371*, 1998a.

_____, *Guide on Section 845/804 Other Transactions (OTs) for Prototype Projects*, November 1998b.

_____, *Annual Report on Cooperative Agreements and Other Transactions Entered into During FY99 Under 10 U.S.C. 2371*, 1999a.

_____, *Report on "Other Transaction" Awards for Prototype Projects Pursuant to 10 U.S.C. 2371, Section 845 (as amended)*, February 1999b.

_____, *Guide on Section 845/804 Other Transactions (OTs) for Prototype Projects*, April 12, 2000a.

_____, *Report on Other Transaction Awards for Prototype Projects*, February 2000b.

_____, *Other Transactions (OT) Guide for Prototype Projects*, January 2001.

DiMucci, Robert, "Audit Guidance on Evaluation of Other Transactions," memorandum for regional directors, Defense Contract Audit Agency, May 12, 1998.

Dunn, Richard L., "Innovations in Government Contracting Using the Authority to Enter into 'Other Transactions' with Industry," testimony before the Committee on Science, U.S. House of Representatives, November 8, 1995.

_____, "DARPA Turns to 'Other Transactions,'" *Aerospace America*, October 1996a.

_____, DARPA General Counsel, "Scope of Section 845 Prototype Authority," DARPA memorandum, October 24, 1996b.

_____, "Other Applications for 'Other Transactions,'" *Aerospace America*, September 1997.

General Accounting Office, *DoD Research: Acquiring Research by Nontraditional Means*, report to congressional committees, Washington, D.C.: General Accounting Office, March 1996.

_____, *DoD's Guidance on Using Section 845 Agreements Could Be Improved*, Washington, D.C.: GAO/NSIAD-00-33, April 2000.

_____, "Review of Section 845 Agreements, Various Programs (Survey Responses)," as of December 31, 1998.

Kaminski, Paul G., Under Secretary of Defense for Acquisition and Technology, Department of Defense news briefing, June 28, 1995.

_____, "Authority to Carry Out Certain Prototype Projects, 10 U.S.C. 2371, Section 845," memorandum for Secretaries of the Military Departments Directors of Defense Agencies, December 14, 1996.

Kuyath, Richard N., "Participant Views of Advanced Research Projects Agency 'Other Transactions,'" *Public Contract Law Journal*, Summer 1995.

Lovelace, Joseph, "Pentagon Agency Gets Serious About Acquisition Reform," *Defense Week*, July 11, 1994.

Mancuso, Donald, "Misc. 2925, Omnibus Legislation to Accompany the DoD Authorization Act Request for Fiscal Year 2001 (Second Session, 106th Congress)," memorandum for the Director, Legislative Reference Service, Department of Defense, December 7, 1999.

Nash, Michael S., William E. Akin, Richard E. Entlich, R. N. C. Lightfoot, *Participant Views of Advanced Research Projects Agency "Other Transactions,"* Institute for Defense Analyses, D-1793, November 1995.

"National Defense Authorization Act for Fiscal Years 1990 and 1991" report of the Committee on Armed Services, 101st Congress, 1st Session, U.S. Senate, pp. 126–127.

"National Defense Authorization Act for Fiscal Year 1994," Pub. L. 103-160, Sect. 845.

"National Defense Authorization Act for Fiscal Year 1997," report of the Committee on National Security, 104th Congress, 2nd Session, U.S. House of Representatives, May 7, 1996, pp. 325–326.

_____, conference report, 104th Congress, 2nd Session, U.S. House of Representatives, July 30, 1996, pp. 48–49, 681.

"National Defense Authorization Act for Fiscal Year 2001," Sec. 807: *Clarification and Extension of Authority to Carry Out Certain Prototype Projects*, Sec. 808: *Clarification of Authority of Comptroller General to Review Records of Participants in Certain Prototype Projects*, Sec. 809: *Eligibility of Small Business Concerns Owned and Controlled by Women for Assistance Under the Mentor-Protégé Program*. S. 2549.

Office of the Inspector General, Department of Defense, *Awards and Administration of Contracts, Grants and Other Transactions Issued by the Defense Advanced Research Projects Agency*, Audit Report No. 97-114, March 1997.

_____, *Cost Charged to Other Transactions*, Audit Report No. D-2000-065, December 1999.

Office of the Under Secretary of Defense for Acquisition and Technology, *Report of the Defense Science Board Task Force on Acquisition Reform Phase IV*, July 1999.

"Strom Thurmond National Defense Authorization Act for Fiscal Year 1999," conference report, 25th Congress, 2nd Session, U.S. House of Representatives, September 22, 1998.

Sumption, Nancy K., "Other Transactions: Meeting the Department of Defense's Objectives," *Public Contract Law Journal*, Vol. 28, No. 3, Spring 1999.

10 U.S.C. 2371, Section 845. "Authority to Carry Out Certain Prototype Projects."

_____, Section 845 as amended by Section 804 of the Fiscal 1997 Authorization Act.

Vacketta, Carl L., Richard N. Kuyath, and Holly Emrick Svetz, "Other Transactions," briefing papers (second series), Federal Publications Inc., March 1998.